

REMARKS

The above amendments and these remarks are responsive to the Office Action mailed May 16, 2006. With entry of this amendment, claims 1-18 are pending. Claim 13 has been amended according to the Examiner's suggestion. Claim 1 has been amended for antecedent basis reasons. Claim 9 was amended to correct a spelling error. No new matter has been added. Applicants thank the Examiner for carefully considering the subject application.

Claims 1-4, 7-14, 17, and 18 were rejected under 35 U.S.C. § 102(b) as being anticipated by Hamburg et al. (U.S. Patent 5,282,360). Claims 5, 6, 15 and 16 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hamburg et al. in view of Schumacher et al. (U.S. Patent 6,116,021). Claims 1, 2, 6, 9, 10, 12, and 16 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kakuyama et al. (U.S. Patent 6,637,194) in view of Hamburg et al.

Claims 1-4, 7-14, 17 and 18

Claims 1-4, 7-14, 17 and 18 were rejected under 35 U.S.C. § 102(b) as being anticipated by Hamburg. Applicants respectfully traverse the rejections, but nevertheless have amended claim 13 as indicated above.

Regarding claim 1, the Office action asserts that Hamburg teaches reading information from a downstream sensor coupled in said emission control system downstream of said emission control device, said information including a substantially linear indication of exhaust air-fuel ratio across a range of air-fuel ratios from at least 12:1 to 18:1, said information also including a substantially non-linear indication of stoichiometry, citing FIG. 1B of Hamburg. However, Applicants have reviewed FIG. 1B, and Hamburg generally, and found no disclosure showing this limitation. In particular, the Office action asserts the down stream sensor (44) exhibits a

sharp change at an air-fuel ratio of 14.7 and is mostly linear for an air-fuel ratio outside an area designated as "linear region". Applicants agree that the cited range of FIG. 1B from Hamburg exhibits a sharp change at an air-fuel ratio of 14.7. However, because of this sharp change at 14:7, it cannot be substantially linear across an entire range a range of air-fuel ratios from at least 12:1 to 18:1.

In other words, the "linear region" expressed in FIG. 1B refers specifically to the area between the dotted lines, that is, the linear region for the pre-catalyst EGO sensor is from approximately 14.65 to 14.7, and the linear region for the post-catalyst sensor is from approximately 14.7 to 14.75, neither of which are across the entire range from at least 12:1 to 18:1. Hamburg's limited linear region is corroborated in the specification at Column 2, lines 58-59, which states "the non-saturated (or linear) region of the EGO sensor characteristic is .05 A/F wide". As such, there is no disclosure of a substantially linear indication of exhaust air-fuel ratio across an entire range of air-fuel ratios from at least 12:1 to 18:1. Since Hamburg does not contain all the limitations of claim 1, the rejection of claim 1 should be withdrawn. Claims 9 and 12 contains similar limitations as claim 1 and thus the above arguments further apply to these claims. Since dependent claims necessarily contain the limitations of claims from which they depend, the rejection of claims 2-4, 7-8, 10-11, 13, 14, and 17-18 should be withdrawn for at least the same reasons as claims 1, 9 and 12.

Claims 5, 6, 15 and 16

Claims 5, 6, 15 and 16 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hamburg et al. in view of Schumacher et al. (U.S. Patent 6,116,021). Applicants respectfully traverse the rejections for the following reasons.

Hamburg does not discuss reading information from a downstream sensor coupled in said emission control system downstream of said emission control device, said information including a substantially linear indication of exhaust air-fuel ratio across an entire range of air-fuel ratios from at least 12:1 to 18:1, said information also including a substantially non-linear indication of stoichiometry.

Schumacher et al. discusses using, in the alternative, a heated exhaust gas oxygen (HEGO) sensor or an exhaust gas oxygen (EGO) sensor in the downstream position (Column 4, lines 61-63), but does not discuss reading information from a downstream sensor coupled in said emission control system downstream of said emission control device, said information including a substantially linear indication of exhaust air-fuel ratio across an entire range of air-fuel ratios from at least 12:1 to 18:1, said information also including a substantially non-linear indication of stoichiometry. Therefore Schumacher et al. does not cure the deficiencies of Hamburg. The rejection of Claims 5-6, and 15-16 should therefore be withdrawn for at least the same reasons as the base claims from which they depend.

Claims 1, 2, 6, 9, 10, 12, and 16

Claims 1, 2, 6, 9, 10, 12, and 16 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kakuyama et al. (U.S. Patent 6,637,194) in view of Hamburg et al. Applicants respectfully traverse the rejections for the following reasons.

Regarding claim 12, Applicants agree with the Office action in that Kakuyama et al. discusses a post-catalytic oxygen sensor that is an on-off type and therefore fails to disclose that this type of sensor generates a first signal providing a substantially linear indication of exhaust air-fuel ratio from at least 12:1 to 18:1, and a second signal generating a substantially non-linear

indication of exhaust air-fuel ratio at or about stoichiometry. As noted, Hamburg does not discuss reading information from a downstream sensor coupled in said emission control system downstream of said emission control device, said information including a substantially linear indication of exhaust air-fuel ratio across an entire range of air-fuel ratios from at least 12:1 to 18:1, said information also including a substantially non-linear indication of stoichiometry. Therefore Hamburg does not cure the deficiencies of Kakuyama et al. and the rejection of claim 12 should be withdrawn. As noted above, independent claims 1 and 9 contain similar limitations. Further, the rejection of claims 2, 6, 10, and 16 therefore should also be withdrawn for at least the same reasons as the base claims from which they depend.

Based on the foregoing comments, the above-identified application is believed to be in condition for allowance, and such allowance is courteously solicited. If any further amendment is necessary to advance prosecution and place this case in allowable condition, the Examiner is courteously requested to contact the undersigned by fax or telephone at the number listed below.

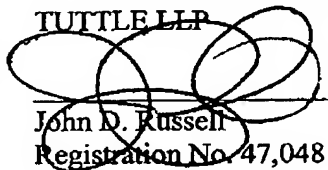
Please charge any cost incurred in the filing of this Amendment, along with any other costs, to Deposit Account 06-1510. If there are insufficient funds in this account, please charge the fees to Deposit Account No. 06-1505.

CERTIFICATE OF FACSIMILE

I hereby certify that this correspondence is being sent via facsimile to the U.S. Patent and Trademark Office at (571) 271-8300 on August 14, 2006.


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